



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

09/774,534

01/31/2001

Bing Chiang

2479.2028-000
(TAN00-18)

3250

21005 7590 03/20/2002

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.
530 VIRGINIA ROAD
P.O. BOX 9133
CONCORD, MA 01742-9133

EXAMINER

GLENN, KIMBERLY E

ART UNIT

PAPER NUMBER

2817

DATE MAILED: 03/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/774,534

Applicant(s)

CHIANG ET AL.

Examiner

Kimberly E Glenn

Art Unit

2817

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- ☐ Interview Summary (PTO-413) Paper No(s). ____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: ____.

DETAILED ACTION

Claim Objections

1. Claims 1-3 are objected to because of the following informalities: In claim 1, applicants disclose a line 17 the phrase " the input/output ports". Examiner suggests changing the phrase to --the input port and the output port--. In both claims 2 and 3 applicants disclose "a branch line". Examiner suggests changing the phases to read -- a first branch line and a second branch line--. Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:
- The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.
3. Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. Claim 1 recites the limitations "the input signal and the phase shifted output signal" in lines 7 and 8 respectively. There is insufficient antecedent basis for this limitation in the claim.
5. Claim 11 recites the limitation "the voltage of the input bias voltage" in line 24. There is insufficient antecedent basis for this limitation in the claim.
6. Claim 14 recites the limitation "the bias voltage port" in line 5. There is insufficient antecedent basis for this limitation in the claim.
7. Claim 15 recites the limitations "the characteristic quadrature port impedance and the characteristic input/output port impedance" in lines 7 and 8. There is insufficient antecedent basis for this limitation in the claim.

Art Unit: 2817

8. With regards to claim 4, applicants disclose “the coupling”. Examiner is unsure which coupling applicant is referring. Claim 1 disclose a coupling between the input and output ports, a coupling between the input port and one of the quadrature ports, a coupling between the output port and of the quadrature ports and a coupling between the first and second quadrature ports.

9. With regards to claim 10, applicants disclose “at least one the varactor diodes”. Claim 8 only discloses one varactor diode.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. In light of the above 35 USC 112 rejection, claims 1-3 6 7 12 and 15 rejected under 35 U.S.C. 102(b) as being anticipated by Ho et al US Pat. 4,305,043.

12. Ho et al disclose a input port (port 1) coupled to receive a input signal; an output port (port 4) coupled to provide the an output signal, the output port coupled to the input port, the coupling between the input port an output port having a characteristic input/output impedance (a) ; a first quadrature port and a second quadrature port (port 2 and 3) , the quadrature port coupled to one another and having a characteristic quadrature impedance (c) , being different from the input/output impedance; a first impedance transformer coupled between the input port and the a first one of the quadrature ports, the first impedance transformer transforming the characteristic input/output impedance across the input and output ports to the characteristic quadrature impedance across the quadrature ports; and a second impedance transformer coupled between

Art Unit: 2817

the a second one of the quadrature ports the output port , the second impedance transformer transforming the characteristic quadrature impedance across the quadrature ports to the characteristic input/output impedance. (Claim 1) A branch line having the characteristic input/output impedance provides the coupling between the input port and the output port. (Claim 2) A branch line having the characteristic quadrature impedance provides the coupling between quadrature ports. (Claim 3) The first and second impedance transformers are implemented as one-quarter-wavelength section of transmission line. (Claims 6 and 7) The characteristic input/ output impedance is 50 ohms. (Claim 12) The characteristic quadrature impedance is lower than the characteristic input/output impedance. (Claim 15) (See figure 3 and 6 and column 4 line 6 through 33 and abstract)

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Art Unit: 2817

15. Claims 8-10 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ho et al US Pat. 4,305,043 in view of Vacanti et al 4,559,489.

16. The primary reference Ho et al, teach a coupler having an input port, output port, a first and second quadrature ports and a first and second transformer. See the above 35 USC 102 rejection for a detailed discussion of Ho et al.

17. Ho et al is shown to teach all the limitations of the claims with the exceptions of a varactor diode coupled to at least one of the quadrature port or both the quadrature ports, an input bias voltage being applied to the varactor diode, a RF choke applied between the bias voltage port and one of the quadrature ports, and the characteristic quadrature impedance being 20 ohms

Vacanti et al shows that it known in the art to provide a coupler with varactor diodes coupled to ports, an input bias voltage being applied to the varactor diode(s) and an Rf choke applied between the bias voltage and the ports. (See figures 2 and column 4 lines 1 through 43)

One skilled in the art at the time the invention was made would have found it obvious to the provide the coupler with varactor diodes as a means of variable capacitance, a input bias voltage as a means to apply a voltage across the varactor diode, and the RF choke as a means to isolates the RF signal from the power supply.

One skilled in the art at the time the invention was made would have found it obvious to the have characteristic quadrature impedance be 20 ohms, since it has been held that discovering an optimum value of a variable involves only routine skill the art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimberly E Glenn whose telephone number is (703) 306-5942.

The examiner can normally be reached on Monday through Friday.

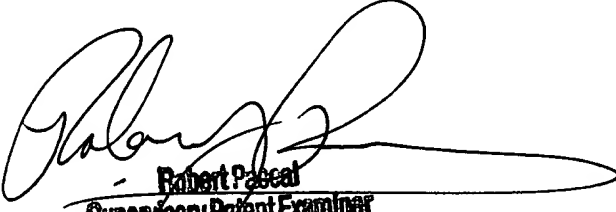
Art Unit: 2817

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on (703) 308-4909. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7724 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Kimberly E Glenn
Examiner
Art Unit 2817

keg
March 14, 2002



Robert Pascal
Supervisory Patent Examiner
Technology Center 2800